Announcements

DEFINITIONS OF TERMS

Upper Columbia Alternative Flood Control and Fish Operations Environmental Impact Statement

Acre-foot: The volume of water that will cover an area of 1 acre to a depth of 1 foot (equal to 43,650 cubic feet, or 325,804 gallons). Used as a measure for water storage volume in reservoirs.

Anadromous fish: Fish, such as salmon or steelhead trout, that hatch in fresh water, migrate to and mature in the ocean, and return to fresh water as adults to spawn.

Artifact: An object of any type made by human hands. Tools, weapons, pottery, and sculptured and engraved objects are artifacts.

Average megawatts (aMW): The average amount of energy (number of megawatts) supplied or demanded over a specified time.

Baseload: In a demand sense, an electrical power load that varies only slightly over a specified time period. In a supply sense, a plant that operates most efficiently at a relatively constant level of generation.

B.C. Hydro: The British Columbia Hydro and Power Authority. This Crown Corporation was formed in 1962 following the merger of an expropriated private utility and the B.C. Power Commission.

Best Available Science: A term used to define guidelines for the use of scientific and technical information in a variety of natural resource related fields. Generally, the term relates to whether the information at question follows a valid scientific process (peer review, methods, logical conclusions and reasonable inferences, quantitative analysis, appropriate context, and references) that produces reliable information.

Biological Opinion: Also known as a BiOp. A document prepared by the US Fish and Wildlife Service or National Marine Fisheries Service under Section 7 of the Endangered Species Act. It is a product of consultation between one of those agencies and any federal agency proposing an action that may affect a species listed as threatened or endangered under the Endangered Species Act, or their designated critical habitat. It includes actions necessary to avoid harm or jeopardy to those listed species.

Bypass system: Structure in a dam that provides a route for fish to move through or around the dam without going through the turbines.

Capacity: The maximum sustainable amount of power that can be produced by a generator or carried by a transmission facility.

Capacity/energy exchange: A transaction in which one utility provides another with capacity service in exchange for additional amounts of firm energy (exchange energy) or money, under specified conditions, usually during off-peak hours.

Columbia River Treaty: A treaty signed by the United States and Canada on September 16, 1964, for joint development of the Columbia River. The treaty is a U.S.-Canadian agreement for bilateral development and management of the Columbia River to achieve flood control and increased power production. Under the Treaty, Canada built three large storage dams: Keenleyside, and Mica on the upper reaches of the Columbia River and Duncan Dam on the Duncan River, a tributary to Kootenay Lake. Libby Dam, on the Kootenai River in Montana is the lone U.S.-built treaty project.

Computer Modeling: The use of mathematical simulations of complex systems, like dam operations in the Columbia basin.

Critical period: The portion of the 50-year streamflow record that would produce the least amount of energy with all reservoirs drafted from full to empty.

Cubic feet per second: A measure of water flow past any given point in a river or through a dam. One cubic foot of water is about 7 ½ gallons.

Cultural resources: The nonrenewable evidence of human occupation or activity seen in any district, site, building, structure, artifact, ruin, object, work of art, architecture, or natural feature that was important in human history at the national, state, or local level.

Damage center: A geographic location on the river system that has historically been subject to damage from flooding.

Demand: The rate at which electric energy is used, whether at a given instant or averaged over any designated period of time.

Depletions: Withdrawals of water from a stream, thereby reducing the volume of instream flow.

Direct-service industries (DSIs): Industrial customers, primarily aluminum smelters, that buy power directly from BPA, rather than from utilities, at relatively high voltages.

Dissolved gas concentrations: The amount of chemicals normally occurring as gases, such as nitrogen and oxygen, which are held in solution in water, expressed in units such as milligrams of the gas per liter of liquid, or percent saturation.

Draft: Release of water from a storage reservoir, expressed in terms of reservoir surface elevation.

Drawdown: Same as draft.

Endangered species: As defined under the federal Endangered Species Act, a plant or animal species which is in danger of extinction throughout all or a significant portion of its range because its habitat is threatened with destruction, drastic modification, or severe curtailment, or because of overexploitation, disease, predation, or other factors. Species listed as endangered are officially designated by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service and published in the Federal Register.

Entrainment: The drawing of fish and other aquatic organisms into tubes or tunnels carrying water for cooling purposes into thermal electric power plants, or for power generating purposes into the turbine intakes of hydroelectric plants. Entrainment May also occur over spillways or through sluiceways of dams.

Environmental Assessment (EA): A concise public document prepared by a Federal agency to provide an evaluation of impacts of a proposed Federal action when impacts ar not believed significant, or can be mitigated to nonsignificance (results in a Finding of No Significant Impact, or FONSI), or to document a decision to prepare an EIS for actions believed to have significant impacts.

Environmental Impact Statement (EIS): A public document prepared by a Federal agency that provides an evaluation of impacts of a proposed Federal action when impacts are determined to be significant as documented in an EA. An EIS contains an analysis and discussion of significant environmental impacts of a proposed action, and informs the public of reasonable alternatives.

Escapement: Number of fish that escape harvest or other mortality and spawn.

Exotic species: Introduced species not native to the place where they are found.

First Nation: Refers to an individual or organization (such as a band or tribal organization) that self-identifies as being descended form aboriginal Indian people in Canada. It is not a term of legal status. "Status Indian" is the Canadian legal term for those peoples.

Fish hatchery: A facility in which fish eggs are incubated and hatched and juvenile fish are reared, typically for release to rivers or lakes.

Fish ladders: A series of ascending pools constructed to enable salmon or other fish to swim upstream, around or over a dam or other barrier to upstream fish migration.

Fish passage facilities: Features of a dam that enable fish to move either upstream or downstream, around, through, or over without harm.

Spill deflectors or flow deflectors: structural modifications made to the spillways of some Columbia-Snake River projects to deflect flows across the downstream (tailwater) water surface, and reduce the deep plunging flows that create high dissolved gas levels.

Flood control rule curve: A curve, or a family of curves, indicating the upper limit of reservoir surface elevation over time, required to maintain reservoir storage space to prevent or control flooding downstream of a dam. (Also called Mandatory Rule Curve or Upper Rule Curve.) The rule curve elevation for a given point in time may be exceeded only temporarily in order to store high runoff to prevent downstream flooding.

Flow: The volume of water passing a given point per unit of time.

Flow Augmentation: The release of water from storage reservoirs to meet sspecific seasonal life stage needs for fish downstream, above what would normally be released for human needs.

Forebay: The portion of the reservoir at a hydroelectric plant which is immediately upstream of the generating station.

Freshet: A rapid temporary rise in streamflow caused by heavy rains or rapid snowmelt.

Full pool: The maximum level of a reservoir under its established normal operating range.

Gas bubble disease: A condition in fish resulting from prolonged exposure to supersaturated gas levels in water. In this condition, dissolved gas comes out of solution as bubbles in the circulatory systems, eyes, and other tissues of fish. The condition is similar to decompression sickness, or 'the bends' in human divers. It may be fatal to fish in some circumstances.

Gas supersaturation: Concentrations of dissolved gas in water that are above the saturation (100 percent capacity) level of the water.

Generation: The act or process of producing electric energy from other forms of energy. Also refers to the amount of electric energy so produced.

Hydrology: The science of dealing with the continuous cycle of evapotranspiration, precipitation, and runoff.

Hydrometeorological observations: Data on snowpack measurements and climatic conditions.

Inflow: Water that flows into a waterbody.

Intake: The entrance to a conduit that passes through a dam or water facility.

Intertie: A transmission line or system of lines permitting a flow of energy between major power systems. BPA has several interties, both AC and DC, connecting the Pacific Northwest to the Southwest.

Juvenile: Early life stage of an animal, having some resemblance to an adult of its kind.

Kuehl-Moffit: A forecasting tool used in predicting runoff volume in the Columbia basin.

Larva (singular; plural larvae): The early life stage of a fish between the time of hatching and transformation to a juvenile stage that more closely resembles an adult.

Levee: A raised embankment constructed to prevent a river from flooding adjacent areas. Known as a dyke in Canada.

Littoral zone: The shallower waters near the shore of a reservoir, lake, or ocean.

Load: The amount of electric power or energy delivered or required at any specified point or points on a system. Load originates primarily at the energy-consuming equipment of customers.

Load following: The adjustment of energy storage releases so that generation and load are continuously in balance. This may mean peak flow releases in daylight hours when demand is high, and reduced releases at night, or it may mean higher flows on weekdays and lower flows on weekends.

Load shaping: See load following.

Local flood control: Flood protection for nearby downstream areas provided by a flood control project or dam.

Low pool: At or near the minimum level of a reservoir under its established normal operating range.

Macrophytes: Aquatic plants that are macroscopic, or large enough to be seen with the naked eye.

Mainstem: The principal river in a basin, as opposed to the tributary streams and smaller rivers that feed into it.

Megawatt (MW): One million watts, or 1,000 kilowatts, a measure of electrical power.

Megawatt-hour (MWh): A unit of electrical energy equal to one megawatt being supplied or used over one hour.

mg/l: Milligrams per liter.

National Environmental Policy Act (NEPA): The Federal law under which environmental impact evaluations are performed for proposed Federal (or Federally permitted) actions, and written as an environmental impact statement (EIS) or

environmental assessment (EA).

Nonpower operating requirements: Operating requirements at hydroelectric projects that pertain to navigation, flood control, recreation, irrigation, and other nonpower uses of the river.

Offpeak hours: Period of relatively low demand for electrical energy, as specified by the supplier (such as the middle of the night).

Operating limits: Limits or requirements that must be factored into the planning process for operating reservoirs and generating projects. (Also see operating requirements, below.)

Operating requirements: Guidelines and limits that must be followed in the operation of a reservoir or generating project. These requirements may originate in authorizing legislation, physical plant limitations, or other sources.

Operating rule curve: A curve, or family of curves, indicating how a reservoir is to be operated under specific conditions and for specific purposes.

Outage: Periods, both planned and unexpected, during which the transmission of power stops or a particular power-producing facility ceases to provide generation.

Outflow: The volume of water per unit of time discharged at a dam.

Peak load: The maximum electrical demand in a stated period of time. The peak load may be the maximum instantaneous load or the maximum average load within a designated period of time.

Phytoplankton: The plant portion of floating or weakly swimming organisms, often microscopic in size, in a body of water.

Plankton: Small plants (phytoplankton) and animals (zooplankton) that are suspended in the water and either drift with the currents or swim weakly.

Power peaking: See load following.

Ramping: The act of reducing outflow from a dam. Ramping rates are set to prevent damage to fish and riverbanks downstream.

Record of Decision: A document detailing a decision taken, as in the case of finalizing the action on an Environmental Impact Statement, together with the reasons for making that decision. Records of Decision may be published in the Federal Register.

Recruitment: Survival of young fish to a given age or life stage; often refers to attainment of a size that makes them catchable by fishing gear. The Recovery Plan for Kootenai River white sturgeon defines recruitment as 'survival of juveniles until

for Kootenai River white sturgeon defines recruitment as survival of juveniles until they become a member of the spawning population.'

Refill: The point at which a hydropower system is considered 'full' from the seasonal snowmelt runoff. Also refers to the annual process of filling a reservoir.

Reliability: For a power system, a measure of the degree of certainty that the system will continue to meet load for a specified period of time.

Reservoir draft rate: The rate at which the release of water from storage behind a dam reduces the elevation of the reservoir. Outflow must exceed inflow for this to occur.

Reservoir elevations: The levels of the water stored behind dams.

Reservoir storage: The volume of water in a reservoir at a given time.

Resident fish: Fish species that reside in fresh water throughout their lives.

Riprap: Broken rock, cobbles, or boulders placed on the bank of a stream or river for protection against the erosive action of water.

River mile: Distance as measured from the river mouth at river mile 0.

Rule curve: Prescribed water levels, represented graphically as curves, that guide reservoir operations.

Run-of-river dams: Hydroelectric generating plants that operate based only on available streamflow and some short-term storage (hourly, daily, or weekly).

Run-of-river reservoirs: The pools or impoundments formed behind run-of-river dams.

Salmonids: Fish of the family Salmonidae, such as salmon, trout (including steelhead), char, and whitefish.

Scoping: The process of defining the extent of a study, primarily with respect to the issues, geographic area, and alternatives to be considered. The term is typically used in association with environmental analysis and documentation in conjunction with a public NEPA process.

Sedimentation: The settling of material (such as dust, suspended solids, or particulates) into water and eventual deposition on the bottoms of streams and rivers.

Shaping: The scheduling and operating of generating resources to meet changing load levels. Load shaping on a hydro system usually involves the adjustment of reservoir releases so that generation and load are continuously in balance.

Simulation: The representation of an actual system by analogous characteristics of a device that is easier to construct, modify, or understand; or by mathematical equations. Computer models are simulations, and for example, are used to represent operation of a hydropower system.

Smolt: A juvenile salmon or steelhead migrating to the ocean and undergoing physiological changes to adapt its body from a freshwater to a saltwater environment.

Spawning: The releasing and fertilizing of eggs by fish.

Spill: Water passed over a spillway or through sluiceways without going through turbines to produce electricity. Spill can be forced, when there is no storage capability and flows exceed turbine capacity, or planned, for example, when water is spilled to enhance juvenile fish passage.

Spillway: Overflow structure of a dam

Storage Reservation Diagram: A graphic representation of how much storage space, in terms of water volume, needs to be reserved each month for flood control in a stroage reservoir such as Libby or Hungry Horse. The storage reservation for each month is based on that month's seasonal inflow forecast.

Storage reservoirs: Reservoirs that have space for retaining water from springtime snowmelts. Retained water is released as necessary for multiple uses that include flood control, power production, fish passage, irrigation, and navigation.

Streamflow: The rate at which water passes a given point in a stream, usually expressed in cubic feet per second (cfs).

Subyearlings: Juvenile fish less than 1 year old.

System flood control: Flood protection for the Portland, Oregon/Vancouver, Washington metropolitan area that is coordinated among all of the storage reservoirs in the Columbia River System.

Tailrace: The canal or channel that carries water away from a dam.

Tailwater: The water surface immediately downstream from a dam or hydroelectric power plant or excess surface water or runoff immediately below an irrigated field or pasture.

Threatened: Legal status under the federal Endangered Species Act afforded to plant or animal species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range, as determined by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.

Turbidity: A measure of the optical clarity of water, which depends on the light scattering and absorption characteristics of suspended and dissolved material in the

water.

Turbine: Machinery that converts kinetic energy of a moving fluid, such as falling water, to mechanical or electrical power.

Upper rule curve (URC): Defines the maximum allowable elevation of the surface of a storage reservoir, described over the course of a water year (Oct-Sep), for flood control purposes.

Usable storage capacity: The portion of the reservoir storage capacity in which water normally is stored or from which water is withdrawn for beneficial uses, in compliance with operating agreements.

VARQ: Abbreviation for Variable Flow (Q represents engineering shorthand for flow or discharge), an alternative flood control operation whereby a storage reservoir is lowered less in winter during years with a low or medium runoff forecast.

Water conditions: The overall supply of water to operate the Pacific Northwest hydroelectric generating system at any given time, taking into account reservoir levels, snowpack, needs to provide water or retain water to meet various operating constraints (such as the Water Budget, flood control, flow constraints, etc.), weather conditions, and other factors.

Water Supply Forecast: Estimates of the volume of water that will runoff from a specific watershed over a specific period of time.

Wortman-Morrow: Forecasting tool developed in the 1980's using estimated or projected future weather conditions to forecast runoff volumes for the Kootenai basin.

Year Class: All individuals of a fish population spawned and hatched in a given year. See also Age Class.

Yearlings: One-year-old juvenile animals, such as fish.

Zooplankton: Free-swimming or floating animal plankton that may be microscopic or difficult to see with the unaided eye.

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